

# Engineering Studies

## Section III (continued)

Marks

**Question 18 — Engineering and the Engineering Report (10 marks)**

- (a) Discuss the use of CAD systems as an alternative to traditional drawing methods. 3

Traditional drawing methods are easier for everyone to use but the use of CAD produces quicker and ~~an~~ alternative designing. CAD systems can not be used by anyone and some education is needed to perform the right actions. As CAD does not produce neat line work, whereas traditional drawing methods can, CAD is a technical system used on the computer, people have to be computer literate to use the program.

Question 18 continues on page 32

## Question 18 (continued)

(b)



- (i) In many public areas, polymer containers similar to those shown are provided for rubbish and recyclable materials. Describe a forming process to produce the main body of these large containers. 2

...a process used to produce the main body of these containers is injection moulding where granules are placed in a heating chamber. The molecules are put into a molten state. Pressed by large industrial machines the body parts of the body are formed and joined together.

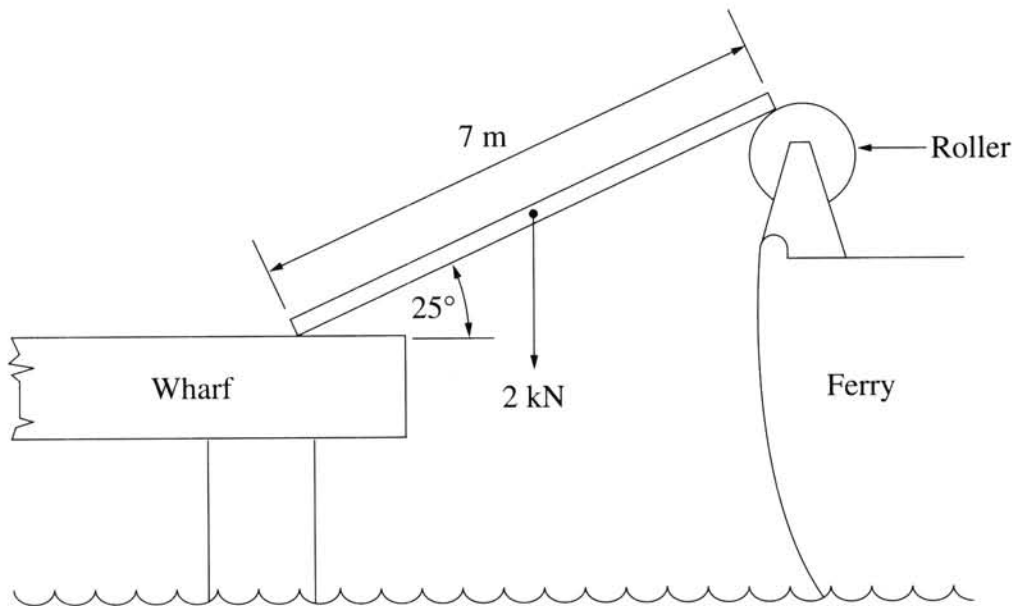
- (ii) The lids used for the containers are moulded from polyethylene. Outline the reasons for this being a suitable choice of material in service. 2

Polyethylene is durable and malleable material. High resistivity material it can withstand different conditions and thermal conductivity.

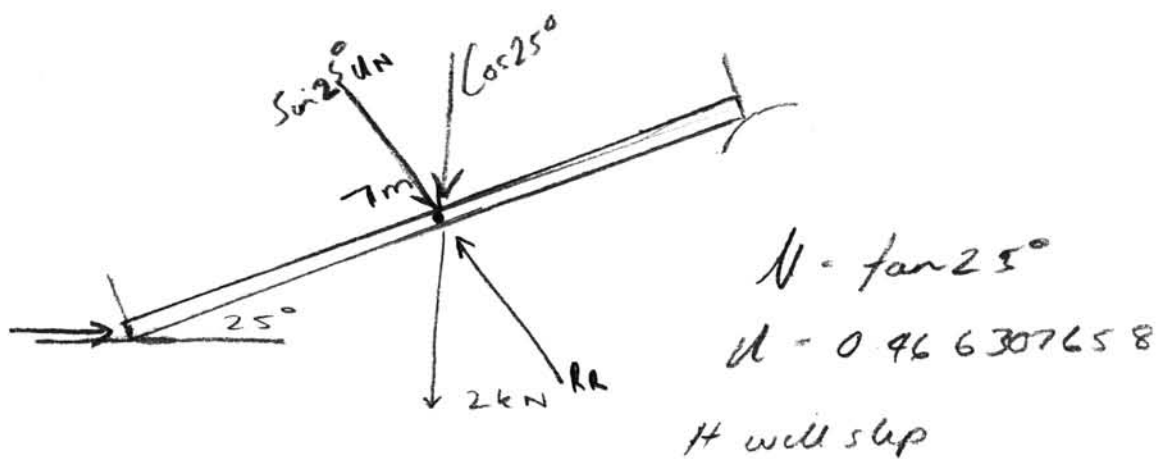
Question 18 continues on page 33

Question 18 (continued)

- (c) A loading ramp between a ferry and a wharf is shown. The ramp has a weight of 2 kN and a coefficient of static friction with the wharf of 0.2. There is no friction at the roller support. 3



Sketch a free-body diagram of the ramp. Show whether the ramp will slip or remain static for these conditions.



End of paper